

What does it take to make a rectangle?

Decide whether the conjectures listed are true or false. If you believe that a conjecture is false, prove that it is false by giving a counterexample. Make sketches of your counterexamples.

1. If one angle of a quadrilateral is a right angle, then the quadrilateral is a rectangle.
2. If one angle of a parallelogram is a right angle, then the parallelogram is a rectangle.
3. If the diagonals of a quadrilateral are congruent, then the quadrilateral is a rectangle.
4. If the diagonals of a parallelogram are congruent, then the parallelogram is a rectangle.
5. If the diagonals of a parallelogram are perpendicular, then the parallelogram is a rectangle.

What does it take to make a rhombus?

1. If one pair of adjacent sides of a quadrilateral are congruent, then the quadrilateral is a rhombus.
2. If one pair of adjacent sides of a parallelogram are congruent, then the parallelogram is a rhombus.
3. If the diagonals of a parallelogram are congruent, then the parallelogram is a rhombus.
4. If the diagonals of a parallelogram bisect the angles of the parallelogram, then the parallelogram is a rhombus.
5. If the diagonals of a parallelogram are perpendicular, then the parallelogram is a rhombus.